having been carried off to serve for other buildings. A fortunate accident—that would seem an evil one at the time—has preserved for us what remains. This portion of the palace has been ravaged by fire, which has entirely destroyed only the timbers of the roofs:—but as the other calcined materials were rendered useless for new constructions, they have been left where they were: and thus, one-third of the edifice remains, to testify of the rest. We have, from time to time, described the sculptures and inscriptions found within its walls; and we announced to our readers the work, which embodying M. Flandin's drawings, will furnish the details of this curious discoverry. We may add that the fragments thought worthy of being collected and transmitted to France, are numerous and important enough to load a ship. —*Athenæum.*

## New Books.

*An Act for regulating the construction and the use of Buildings in the Metropolis and its neighbourhood, with a* CYCLOPÆDIA *arranged Alphabetically, and accompanied by extensive references and counter-references to the sections of the Act itself.* By A. BARTHOLOMEW, Esq., F.S.A., Architect. Published at 2, York-Street, Covent Garden.

THE Cyclopædia which accompanies this edition of the New Metropolitan Buildings Act was first published in "THE BUILDER." Its value was at once recognised so fully by the public and the profession, that the author was induced to revise the whole, enlarge it considerably, and arrange it in the pocket form, in which it is now issued. Together with the Act in full, it is no larger than an ordinary pocket-book, and cannot fail to be acceptable to all the numerous classes connected with house property. By a reference to it, all the parts of the Act which bear on a particular question are at once seen, accuracy is secured, and much time saved. Appended to it is a full list of the district surveyors and their offices.

*The History and Art of Warming and Ventilating Rooms and Buildings; with Notices of the Progress of personal and fire-side Comforts, and of the Management of Fuel.* By WALTER BERNAN, Civil Engineer. 2 vols. London: 1845. George Bell.

IN seventeen essays, illustrated by 240 diagrams; these two volumes present a very interesting history of the contrivances adopted for warming and ventilating rooms and buildings, such as open fires, hypocausts, German, Dutch, Russian, and Swedish stoves, steam, hot-water, heated air, and others, arranged, in most cases, in the order in which they appeared. It is very clearly written, and displays considerable research. The subject is one of paramount importance, and demands consideration.

As the author observes in his preface, "Though much has been done by ingenious men in the art of distributing heat for household uses, it must be confessed, that in one or two instances only have they been able to make a permanent impression or bring their contrivances into that general use as to constitute them 'machines of society;' while in the economy of fuel for manufacturing purposes invention has already produced marked benefits; yet however great the saving that may ultimately be effected in furnaces, still, from the nature of things, it must ever be of small importance when compared with that which would arise were better methods of heating and ventilating dwelling-houses generally followed;—of the fifteen-and-a-half millions of tons of coals raised yearly from the mines, not more than three-and-a-half millions are consumed by steam-engines and in manufacturing operations,—leaving eleven or twelve millions of tons of fuel to be mismanaged in kitchens and sitting-rooms throughout the country. The register-plate was described at the close of the fifteenth century by Alberti, the ancient Florentine architect, and by others who wrote afterwards. Were this simple and cheap smoke-valve introduced into every cottage chimney, it would save the heat of five or six millions of tons of coals that is now annually wasted and thrown away."

From the essay on heating by means of steam, we extract the following table collected from cases given by various parties, which "exhibits the practical effect of a given surface of steam-pipe in keeping a certain cubic area of building at a certain temperature, when the external air was *under* the *freezing point* of water:—

| Description. | Cubic feet of space heated by one square foot of pipe. | Temperature of internal air. |
|---|---|---|
| A chapel; cast-iron pipes | 400 | 60° |
| A meeting-house; cast-iron pipes | 370 | |
| A church; massive walls and stone pillars, inside stone, no plastering or wainscot, except for seats, cast-iron pipes | 370 | 48° |
| Dining-room; cast-iron pipes | 100 | 64° |
| Ditto, containing 8,400 cubic feet of space, 15 feet from floor to ceiling | 300 | 62° |
| Public-room; cast-iron pipes | 305 | 54° |
| Cotton-mill; tin-plate pipes, not painted | 300 | |
| Six cotton-mills, each containing on an average 205,806 cubic feet of space, cast-iron pipes | 175 | 60° |
| Staircase, average of five, with lantern lights | 168 | 56° |
| Average of four others with window in wall | 174 | 56° |
| Rooms in an inn | 200 | |
| Counting-house, lighted from the ceiling | 256 | 61° |
| Average of three do. lighted from side | 243 | 64° |
| Average of seven rooms in a public building, heated by an ornamental cast-iron vase in each, ¾ inch thick; greatest effect | 140 | 56° |
| One of the rooms, fitted with a double window, could be kept at | | 64° |
| Calico-printers' work-room | 90 | 80° |
| Ditto. press-room | 144 | 80° |
| Forcing-house | 30 | 90° |
| Drying-house; cast-iron pipe | 80 | 100° |
| Ditto; tin-plate pipes | 60 | 90° |
| Ditto; walls and windows defective | 25 | 90° |
| Forcing-house, glass very defective | 25 | 75° |
| Printing-office; four floors average | 266·5 | 60° |

"The quantity of steam-heated surface required to produce a certain average temperature may be readily approximated by dividing the cubic contents in feet of the building to be heated by the number placed in the first column opposite the description of a similar building. Thus, for a factory containing 100,000 feet of space, this number divided by 175 in the table will give 574·2, which is the number of square feet of pipe surface that will keep it at a temperature of 60° in the coldest weather. If the cubic area of a dining-room be 5,000 feet, this divided by 140, one of the numbers in the table, will give about 35·7 square feet of steam-pipe surface required to warm it to a summer heat, with the air outside at the freezing point. These, it is obvious, although rough, are safe practical estimates that may be applied and depended on in numerous analogous cases.

"The required quantity of steam-pipe is sometimes estimated in another way. If, for example, 200 cubic feet of air are to be supplied in a minute to a room which is to be kept at a temperature of 60°, when the external air is at the freezing point, and the average heat of the surface of the steam-pipe is to be 200°, then, if the difference between the temperature the room is to have and the external air be multiplied by the number of cubic feet of air required per minute, and the product divided by 2·1 times the difference between 200 and the temperature of the room, the quotient will give the number of square feet of heating surface required, thus:—

$$(60-32) \times 200 = 5600 \div 2{\cdot}1\ (200-60°) = 19$$

which is the square feet of heating surface to be used.

"An estimate formed from the table omits the consideration of any definite amount of ventilation; and formed from the rule above, omits any reference to the cubic space to be heated. For instance, a room containing the same number of persons and windows, but of twice the cubic capacity, or one with double the superficial area of radiating wall, ceiling, and floor, would be supplied with the same quantity of pipe! The rough approximation to be had from the table will therefore be found a useful check on the still rougher guesses made by means of the rule.

"In Dr. Arnott's method of finding the amount of heating surface, one of the omissions in Mr. Tredgold's rule is supplied, 'to maintain,' says the doctor, 'in an ordinary apartment the agreeable and healthful temperature of 60°, there must be of surface of steam-pipe, or other steam-vessel heated to 200° (which is the average surface temperature of vessels filled with steam at 212°), about one foot square for every six feet of single glass window of usual thickness; as much for every 120 feet of wall, roof, and ceiling of ordinary material and thickness; and as much for every six cubic feet of hot air escaping per minute as ventilation, and replaced by cold air. A window with the usual accuracy of fitting is held to allow about eight feet of air to pass by it in a minute; and there should be for ventilation at least three feet of air a minute for each person in the room. According to this approximation, a room 16 feet square by 12 feet high, with two windows each 7 feet by 3, and with ventilation by them or otherwise, at the rate of 16 cubic feet a minute, would require 20 feet of pipe 4 inches diameter, or any other iron vessel having the same extent of surface.'

"If pipes 3 inches diameter externally are to be used, then the amount in square feet of heating surface multiplied by 1·09 will give the number of feet in length of 3-inch pipes required; or of 4-inch pipes, if multiplied by 82; of 5-inch pipes, by ·66; and 6-inch pipes, by ·55. Thus in the above example, $23{\cdot}7 \times 0{\cdot}82 = 19{\cdot}4$, which will represent the number of feet of 4-inch pipe required to heat 200 cubic feet of air in a minute from the temperature of 30° to 60°.

"The allowance made for the expansion of cast-iron pipes is in practice ¼ inch in 10 feet; or $\frac{1}{480}$ of their length. When heated from 32° to 212°, cast-iron expands $\frac{1}{810}$ of its length, bar-iron $\frac{1}{815}$, copper $\frac{1}{577}$, brass $\frac{1}{534}$, tin $\frac{1}{515}$, lead $\frac{1}{353}$, zinc $\frac{1}{344}$.

"The size of the boiler is regulated by the capacity of the heating-pipes. As much space is left for the steam in the boiler as is equal to all the steam in the pipes; and the space for the water may be about one-eighth less. The water-line should always be kept above the highest part of the flue."

We shall probably return to this work, and in the meantime recommend it to our readers.

## CORRESPONDENCE ON METROPOLITAN BUILDINGS ACT.

### WHO HAS POWER TO DECIDE WHAT IS A COMMENCEMENT?

SIR,—Finding it necessary to obtain for my own guidance counsel's opinion upon two points of the Metropolitan Buildings Act, I inclose you a copy thereof, thinking it may be of service to your readers, should you think proper to give it insertion in your valuable publication.

Your obedient servant,
A CONSTANT READER.

Clapham, Jan. 29, 1845.

(*Copy.*)

Having carefully perused and considered the Metropolitan Buildings Act with reference to the two points submitted to me—namely, "What is a commencement of a building within the meaning of the Act?" and, "Who has the power to decide what is a sufficient commencement?"

I am of opinion that any acts which amount to a *bonâ fide* beginning, upon which it is intended to raise a superstructure, are sufficient to meet the object of the legislature; otherwise it would of course be very difficult to determine where the line is to be drawn, and say what acts just amount to a commencement and what are below the mark; I therefore have no hesitation in concluding that if foundations are commenced and a few courses of bricks laid (so as to denote absolutely an intention to build), it is "commenced" in terms of the Act.

On the second point,—The 82nd section gives power to the official referees to determine disputes *as to the effect of the provisions of the Act* in any case. This power must pertain *solely* to cases which are admitted to be within the operation of the Act, therefore they have no jurisdiction over such as are "commenced before Jan. 1, 1845," provided they are "covered in and rendered fit for use within twelve months thereafter;" but should they assume such jurisdiction, the remedy would be by action, or an application to the Court according to the act of interference.

Temple, Jan. 27, 1845.

[We have not the name of the party who gave this opinion, and can hardly believe that it proceeds from one "learned in the law." The 80th section, which provides for the ap-

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